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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,738	09/26/2003	Dae-Lim Park	041993-5231	6760

9629 7590 03/14/2005

MORGAN LEWIS & BOCKIUS LLP
1111 PENNSYLVANIA AVENUE NW
WASHINGTON, DC 20004

EXAMINER

DUONG, THOI V

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/670,738

Applicant(s)

PARK ET AL.

Examiner

Thoi V. Duong

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 ~~is~~/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 ~~is~~/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 11, 12, 15 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Dohjo et al. (Dohjo, USPN 5,835,177).

Re claim 1, as shown in Figs. 1 and 4, Dohjo discloses a data pad region “signal line pad” of a liquid crystal display panel 1, comprising:

a plurality of data lines 110 vertically arranged at specified intervals;

a plurality of data pads 162 respectively connected to the data lines;

at least one first side contact with a first area 166 (contact hole) formed in each data pad 162; and

at least one second side contact with a second area 165 (contact hole) formed in each data pad, wherein the first area is larger than the second area (Fig. 4).

Re claim 11, as shown in Figs. 1 and 4, Dohjo discloses a data pad region "signal line pad" of a liquid crystal display panel 1, comprising:

a substrate 101;

a gate insulating layer 115, data lines 110 and a passivation film 127 in a data pad forming region of the substrate, wherein the passivation film in the data pad forming region including at least one first side contact hole 166 with a first area and at least one second side contact hole 165 with a second area, wherein the first area is larger than the second area (Fig. 4); and

at least one first side contact electrically connecting one of the data lines 110 (125b) to a conductive layer 131 at the first side contact hole 166 and at least one second side contact electrically connecting the data line 110(125b) to the conductive layer 131 at the second side contact hole 165,

wherein, re claim 12, the passivation film 127 is made of an organic material (col. 7, lines 43-50); and

wherein, re claim 15, the data line 110 is made of Mo (col. 7, lines 28-37).

Re claim 16, as shown in Figs. 1 and 4, Dohjo discloses a liquid crystal display panel, comprising:

a substrate 101 having an image display region with unit pixels arranged in a matrix and a data pad region "signal line pad" at the periphery of the image display region (Fig. 1), wherein the data pad region includes:

a plurality of data lines 110 vertically arranged at specified intervals;
a plurality of data pads 162 respectively connected to the data lines 110(125b);
at least one first side contact with a first area 166 formed in each data pad 162;
and
at least one second side contact with a second area 165 formed in each data pad 162, wherein the first area is larger than the second area (Fig. 4).

3. Claims 1-6, 8, 11-13, 15 and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Oh et al. (Oh, USPN 6,771,348 B2).

Re claims 1-3, as shown in Figs. 4, 6 and 9, Oh discloses a data pad region 250 of a liquid crystal display panel, comprising:

a plurality of data lines 220 vertically arranged at specified intervals (col. 5, lines 8-12);

a plurality of data pads 251 respectively connected to the data lines (col. 5, line 66 through col. 6, line 1);

at least one first side contact with a first area having 6 contact holes 252a formed in a central portion of the data pad 251 (see the attached Fig. 6); and

at least one second side contact with a second area having 3 contact holes 252a formed at one end of the data pad 251, wherein the first area is larger than the second area since the first area has 6 contact holes while the second area has only 3 contact holes (see the attached Fig. 6),

wherein at least two second side contacts are respectively formed at one end of each data pad and at the other end of each data pad (see the attached Fig. 6).

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Re claim 4, as shown in Figs. 6 and 8E, Oh discloses a method for fabricating a data pad region of a liquid crystal display panel, comprising:

forming a gate insulating layer 212, data lines 251 (data pad) and a passivation film 252 in a data pad forming region 250 of a substrate 200 (col. 7, lines 13-48);

forming two first side contact holes with a first area at the central region of the data pad forming region 250 and forming two second side contact holes with a second area respectively at both edges of the data pad forming region, wherein the first area comprising two contact holes is larger than the second area comprising one contact hole; and

forming at least one first side contact electrically connecting one of the data lines 251 to a conductive layer 513 at the first side contact hole and forming at least one second side contact electrically contacting the data line to the conductive layer at the second side contact hole by patterning a conductive material 253 (see also Fig. 10).

Re claim 11, as shown in Figs. 4, 6 and 8E, Oh discloses a data pad region 250 of a liquid crystal display panel 600, comprising:

a substrate 200;

a gate insulating layer 212, data lines 220(251) and a passivation film 252 in a data pad forming region 250 of the substrate, wherein the passivation film in the data pad forming region including a first area having six first side contact holes 252a and a second area having three second side contact holes 252a, wherein the first area is larger than the second area (see Fig. 6 attached); and

at least one first side contact electrically connecting one of the data lines 220(251) to a conductive layer 253 at the first side contact hole and at least one second side contact electrically connecting the data line 220(251) to the conductive layer 131 at the second side contact hole,

Re claims 5, 6, 12 and 13, the passivation film 252 is made of an organic material such as BCB (benzocyclobutene) (col. 7, line 66 through col. 8, line 1).

Re claim 8 and 15, the data line 220(251) is made of Mo (col. 7, lines 24-33).

Re claim 16, as shown in Figs. 4, 6 and 8E, Oh discloses a liquid crystal display panel 600, comprising:

a substrate 200 having an image display region with unit pixels arranged in a matrix and a data pad region 250 at the periphery of the image display region (Fig. 4), wherein the data pad region includes:

a plurality of data lines 220 vertically arranged at specified intervals;

a plurality of data pads 251 respectively connected to the data lines 220(col. 7, lines 25-32);

at least one first side contact with a first area formed in each data pad 251 (see Fig. 6 attached); and

at least one second side contact with a second area formed in each data pad 251, wherein the first area is larger than the second area (see Fig. 6 attached).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dohjo et al. (Dohjo, USPN 5,835,177) in view of Kim et al. (USPN 6,281,959 B1).

Dohjo discloses a data pad region that is basically the same as that recited in claims 2 and 3 except for positioning the first side contact in a central portion of the data pad and forming at least two second side contacts respectively at one end of each data pad and at the other end of each data pad.

As shown in Figs. 10 and 11A, Kim et al. discloses a pad 101 and the arrangement of the contacts H1, H2 and H3 on the pad 101, wherein the contact H3 is formed in a central portion of the pad 101 and the contacts H1 and H2 are respectively formed at one end of the pad 101 and at the other end of the pad 101.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the data pad of Dohjo with the teaching of Kim et al. by forming the first side contact in a central portion of the data pad and forming at least two second side contacts respectively at one end of each data pad and at the other end of each data pad for improving the arrangement of the connecting wires to minimize a space required for the wires (col. 2, lines 4-8).

6. Claims 1-4, 8, 9, 11, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoo et al. (Yoo, Pub. US 2001/0030718 A1) in view of Ito et al. (Ito, USPN 5,748,179).

Re claim 1, as shown in Fig. 6D, Yoo discloses a data pad region of a liquid crystal display panel, comprising:

- a plurality of data lines 110 vertically arranged at specified intervals;

- a plurality of data pads 120 respectively connected to the data lines;

- at least one first side contact with a first area (contact hole 122) formed in each data pad 120 (page 3, paragraph 44); and

- at least one second side contact with a second area (contact hole 122) formed in each data pad 120 (page 3, paragraph 44).

Re claim 4, as shown in Figs. 6A-6D, Yoo discloses a method for fabricating a data pad region of a liquid crystal display panel, comprising:

- forming a gate insulating layer 150, data lines 110 and a passivation film 112 in a data pad forming region 120 of a substrate 90;

- forming a plurality of side contact holes 122; and

- forming a plurality of side contacts electrically connecting the data lines 110 to a conductive layer 124 at the side contact holes by patterning a transparent conductive material (page 4, paragraph 49).

Re claim 11, as shown in Figs. 5 and 6D, Yoo discloses a data pad region of a liquid crystal display panel, comprising:

- a substrate 90;

- a gate insulating layer 150, data lines 110 and a passivation film 112 in a data pad forming region of the substrate, wherein the passivation film in the data pad forming

region including at least one first side contact hole 122 with a first area and at least one second side contact hole 122 with a second area (page 3, paragraph 44); and

at least one first side contact electrically connecting one of the data lines 110 to a conductive layer 124 at the first side contact hole 122 and at least one second side contact electrically connecting the data line 110 to the conductive layer 124 at the second side contact hole 122.

Re claims 8, 9 and 15, the data line 110 is made of Mo and etched by dry-etching (page 4, paragraphs 46 and 47).

Re claim 16, as shown in Figs. 5 and 6D, Yoo discloses a liquid crystal display panel, comprising:

a substrate 90 having an image display region with unit pixels arranged in a matrix and a data pad region at the periphery of the image display region (Fig. 5), wherein the data pad region includes:

a plurality of data lines 110 vertically arranged at specified intervals;

a plurality of data pads 120 respectively connected to the data lines 110 (Fig. 6D);

at least one first side contact with a first area (contact hole 122) formed in each data pad 120 (page 3, paragraph 44); and

at least one second side contact with a second area (contact hole 122) formed in each data pad 120 (page 3, paragraph 44).

Yoo et al. discloses a method for fabricating a data pad region of a liquid crystal display panel that is basically the same as that recited in claims 1-4, 11 and 16 except

for forming at least one first side contact hole with a first area at the central region of the data pad forming region and forming at least two second side contact holes with a second area respectively at both edges of the data pad forming region, wherein the first area is larger than the second area.

As shown in Fig. 3, Ito discloses a pad region Td comprising contact areas TEST wherein the contact area in the middle portion is larger than the contact areas at both edges of the pad region Td to increase the area of a portion of a conductive film d1 to facilitate the test (see also Fig. 4C and col. 6, line 59 through col. 7, line 4).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method for fabricating a data pad region of a liquid crystal display panel of Kim with the teaching of Ito by forming at least one first side contact hole with a first area at the central region of the data pad forming region and forming at least two second side contact holes with a second area respectively at both edges of the data pad forming region, wherein the first area is larger than the second area so as to broaden the contact area of the first area to facilitate testing the display (col. 7, lines 1-4).

7. Claims 5-7 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoo et al. (Yoo, Pub. US 2001/0030718 A1) in view of Ito et al. (Ito, USPN 5,748,179) as applied to claims 1-4, 8, 9, 11, 15 and 16 and further in view of Kim et al. (Kim, USPN 6,100,954).

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The method for fabricating a data pad region of a liquid crystal display panel of Yoo as modified in view of Ito above includes all that is recited in claims 5-7 and 12-14 except for the material of the passivation film.

As shown in Fig. 21B, Kim discloses a passivation film comprising an inorganic film 179 (SiNx), an organic material 159 such as BCB, and an inorganic film 181 (SiNx) (col. 22, lines 8-25).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Oh with the teaching of Kim by forming the passivation film as a triple deposition structure of SiNx film/BCB (benzocyclobutene) film/SiNx film so as to provide an LCD with less parasitic capacitance and free from poor adhesion at the interface between an insulation layer and a semiconductor layer (col. 5, lines 30-35).

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoo et al. (Yoo, Pub. US 2001/0030718 A1) in view of Ito et al. (Ito, USPN 5,748,179) as applied to claims 1-4, 8, 9, 11, 15 and 16 and further in view of Lyu et al. (Lyu, USPN 6,001,539).

As shown in Fig. 6D, Yoo discloses the gate insulating layer 150 exposed at the bottom surfaces of the side contact holes 122. However, Yoo does not disclose that the passivation film 112 is etched by dry-etching.

Lyu discloses that if the passivation film covers the data pads, it could be simultaneously etched when the contact hole is formed by using the dry-etching method (col. 4, lines 55-62).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the method of Yoo of with the teaching of Lyu by etching the passivation film by dry-etching to prevent the penetration of an organic solution which causes the undesirable swelling of the insulating layer (col. 6, lines 9-16).

9. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh et al. (Oh, USPN 6,771,348 B2) in view of Kim et al. (Kim, USPN 6,100,954).

Oh discloses a method for fabricating a data pad region of a liquid crystal display panel that is basically the same as that recited in claims 7 and 14 except for forming the passivation film as a triple deposition structure of SiNx film/BCB (benzocyclobutene) film/SiNx film.

As shown in Fig. 21B, Kim discloses a passivation film as a triple deposition structure comprising an inorganic film 179 (SiNx), an organic film 159 (BCB) and an inorganic film 181 (SiNx) (col. 22, lines 8-25).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Oh with the teaching of Kim by forming the passivation film as a triple deposition structure of SiNx film/BCB (benzocyclobutene) film/SiNx film so as to provide an LCD with less parasitic capacitance and free from poor adhesion at the interface between an insulation layer and a semiconductor layer (col. 5, lines 30-35).

10. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh et al. (Oh, USPN 6,771,348 B2) in view of Yoo et al. (Yoo, Pub. No. US 2001/0030718 A1) and Lyu et al. (Lyu, USPN 6,001,539).

Oh discloses a method for fabricating a data pad region of a liquid crystal display panel that is basically the same as that recited in claims 9 and 10 except for etching the passivation film and the data line by dry-etching.

However, the dry-etching is a common method known in the art as shown in Fig. 6D of Yoo where a data line 110 connected to a data pad 120 can be dry-etched to expose the planar portions of a gate insulating layer 150 (page 4, paragraphs 46-48).

Further, Lyu discloses that if the passivation film covers the data pads, it could be simultaneously etched when the contact hole is formed by using the dry-etching method (col. 4, lines 55-62).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the method of Oh of with the teaching of Lyu by etching the passivation film by dry-etching to prevent the penetration of an organic solution which causes the undesirable swelling of the insulating layer (col. 6, lines 9-16).

11. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dohjo et al. (Dohjo, USPN 5,835,177) in view of Kim et al. (Kim, USPN 6,100,954).

Dohjo discloses a data pad region of a liquid crystal display panel that is basically the same as that recited in claims 13 and 14 except for forming the passivation film as a triple deposition structure of SiNx film/BCB (benzocyclobutene) film/SiNx film.

As shown in Fig. 21B, Kim discloses a passivation film as a triple deposition structure comprising an inorganic film 179 (SiNx), an organic film 159 (BCB) and an inorganic film 181 (SiNx) (col. 22, lines 8-25).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the data pad region of the liquid crystal display panel of Dohjo with the teaching of Kim by forming the passivation film as a triple deposition structure of SiNx film/BCB (benzocyclobutene) film/SiNx film so as to provide an LCD with less parasitic capacitance and free from poor adhesion at the interface between an insulation layer and a semiconductor layer (col. 5, lines 30-35).

Conclusion


12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

Thoi Duong



03/06/2005



ROBERT H. KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800